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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/772,989	01/31/2001	Hideki Morishima	2369.12210	2633
5514	7590	09/13/2004	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO			CHANG, AUDREY Y	
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NEW YORK, NY 10112			PAPER NUMBER	
			2872	

DATE MAILED: 09/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/772,989

Applicant(s)

MORISHIMA ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **July 9, 2004** has been entered.
2. This Office Action is also in response to applicant's amendment filed on July 9, 2004, which has been entered into file.
3. By this amendment, the applicant has newly added claims 25-28.
4. Claims 1-5, and 7-28 remain pending in this application.

Response to Amendment

5. The amendment filed on **July 9, 2004** is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: **the newly added claims 25-28** recite a stereoscopic image display apparatus having a first and second optical systems such that the second optical system includes a second lens array having a plurality of second lenses having a refractivity toward a *horizontal direction* and the first optical system having a plurality of first lenses having a refractivity toward *horizontal direction*. The specification ONLY gives the support for the second optical system to have lens array with **refractive optical power in BOTH horizontal and vertical direction**. The specification does not teach to be possible to just use a *single* lens array having refractive power just in the horizontal direction. Since by just have *single* refractive optical power in the *horizontal* direction will not be able to direct the stripe shaped image light passes

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through the mask regions; the horizontal lens power will make the stripe image into a plurality of vertical lines, which will not be able to pass the mask and to form stereoscopic image be viewed by the observer.

The newly submitted claim 26 also recites the second optical system includes “a third lens array having a plurality of third lenses having **reflectivity** toward a vertical direction” that is not supported by the specification. The specification simply does not teach the lens has “**reflectivity**”.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 25-28 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The reasons for rejection based on the newly added matters are set forth in the paragraph above.

8. **Claims 17-22 and 25-28 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification and the claims fail to teach how could the stereoscopic image display apparatus be capable of permitting the observer to stereoscopically observe image by simply having a first optical system being a *lenticular* lens having a periodic *horizontal* structure and a second optical system having

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just a vertical lenticular lens or having second lenses with “refractivity toward horizontal direction”.

The specification and all of the Figures in the instant application teach to use a second optical system having optical element(s) with periodic structure in **both horizontal and vertical** directions such that the stripe like image light is focused by the second optical system in **both** the vertical and horizontal direction (i.e. the second optical system must have optical power in BOTH the horizontal and vertical directions), in order for the image light to be directed through the light transparent regions on the mask. Such image light direction cannot be achieved by having just a single horizontal optical power, since the horizontal optical power of the second optical system will make the stripe like images into a plurality of vertical lines. If the second optical system does not also have optical power in the vertical direction to focus or converge these vertical image lines, these image lines will not be able to pass the transparent regions of the mask, which therefore WILL NOT be able to provide the images for viewing. The stereoscopic image display as recited in these claims is not enable and not operable. Claims 18-22 and 26-27 inherit the rejection from their respective based claims.

Claim Objections

9. **Claims 5, 7 and 25-28 are objected to because of the following informalities:**

(1). The phrase “planes defined by intersections of straight lines connecting i) two adjacent view points ... and ii) a horizontal center of each elementary optical element forming the second optical system” recited in claim 5 is wrong and confusing. The applicant is respectfully noted that the “*intersections*” of the straight lines, (as demonstrated by Figures 3), defines a plane that is the plane of the page, yet neither the display device nor the second optical system is placed on the plane defined by the page. Also is should be “**each** of two adjacent view points” since the straight lines are connecting one view point only.

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(2). Claim 7 is confusing and needed to be reworded. Firstly again it should be “**each** of two adjacent view points”. Secondly it is not clear what does it mean by “common to”. Does it mean *coincide* or not? The phrase “agree with” is confusing.

(3). The phrase “refractivity *toward* a horizontal direction (or vertical direction)” recited in claims 25-28 is confusing and indefinite since it is not clear what does it mean by “refractivity **toward** a vertical or horizontal direction”. The lens may have horizontal **optical power** or vertical **optical power** that converges or diverges light along a vertical direction or a horizontal direction but it is not clear what does it mean by “refractivity toward a direction”.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 17-18, 20 and 21 and newly added claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ezra et al (PN. 5,703,717) in view of the patent issued to Mashitani et al (PN. 5,663,831).**

Ezra et al teaches a *three dimensional display apparatus* that is comprised of a *spatial light modulator* (23, Figure 7), serves as the *image display element* for displaying a *spatially multiplexed 2D images having interlaced stripes of image* for different view points, (please see column 5, lines 20-25), a *lenticular screen* (42) placed in front of the image display element and an *angular amplifying element* (33) having a *first lenticular lens array* (34) for focusing the image at a *plane diffuser* (35) and a *second lenticular lens array* (36) for converging the image light passes through the plane diffuser to *different*

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viewing locations, (please see Figures 4 and 7, columns 4-5). The *lenticular screen* (42) and the *first lenticular lens array* (34) together serve as the *second optical member* that condenses the stripe image to the plane diffuser and the *second lenticular lens array* (36) serves as the *first optical member* for directing the image light to viewing zone. The distance between the lenticular lens array (34) and the diffuser (35) is equal to the **focal length** of the lenticular lens array (34), (please see Figure 4). The lenticular lens array (34) is a *vertical* lenticular lens having periodic arrangement in the *horizontal plane*, (i.e. the plane of the page of Figure 4). The lenticular screen (42) implicitly forms the images of pixels on the plane diffuser in order for the three dimensional display apparatus to be operable. Ezra et al teaches that the stripes of images for different view points are displayed on the spatial light modulator in an *interlaced* manner, (please see column 5, lines 20-25).

With regard to the feature concerning the first optical member being a lenticular lens having a periodic structure in horizontal direction and having a plurality of elementary optical elements that each constitute one period of the periodic structure in the horizontal direction and the lenticular lens of the first optical member is at a distance of the focal length of the elementary optical element from the mask. Ezra et al teaches specifically that the second lenticular lens array (36, serves as the first optical member), is a lenticular lens array having a *periodic* structure in the *horizontal* direction and each lenticular lens forming a period of the periodic structure. Furthermore, Ezra et al teaches specifically that the second lenticular lens (36) is placed at the *focal distance* (of each lenticular lens) from the plane diffuser, (please see Figure 4).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the plane diffuser has a mask pattern of openings and shields. However it is known in the art that a plane diffuser that placed in front of the display element *essentially* has a mask pattern of openings and shields as demonstrated by the teachings of Mashitani et al wherein a *diffusing plate* (3, Figure 5) has a *mask pattern of black regions and opening regions* (i.e. images forming regions). It

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would then have been obvious to one skilled in the art to make the plane diffuser of Ezra et al with mask pattern for the benefit of blocking unwanted light from the display to the observer, which therefore improves the image quality.

With regard to claim 18, Ezra et al teaches that the first and second lenticular lens arrays have optical power in the horizontal direction. With regard to claim 20, Ezra et al teaches that the spatial light modulator (23, Figure 7) serves as the *image display element* for displaying spatially multiplexed 2D images having stripes of image for different view points. With regard to claim 21, the focal distance of lenticular lens array (34) for the second optical member is different from the distance between the array and the image display element, (i.e. the spatial light modulator 23).

With regard to the features (claims 25 and 28) concerning the synthesized left eye and right eye images are of stripes image, Ezra teaches explicitly that the spatially multiplexed image comprises a plurality of 2D images such that the stripes of the images are interlaced. It is implicitly true that in order to create stereoscopic image, the interlaced stripes of images are of left eye and right eye image stripes being interlaced together, (please see column 5, lines 20-25). It is implicitly true that the stripe image has a longer dimension in one direction than the other.

Allowable Subject Matter

12. The following is a statement of reasons for the indication of allowable subject matter: of the prior art references considered, none has disclosed a stereoscopic image display method that is comprised of the step of guiding image light from an image display element by a *second* optical system, placed in front of the display element, to a *mask* member having a mask pattern, and the step of converging the image light passes through the mask member by a *first* optical system to an observation surface. The second optical system has predetermined periodic structure in *each* of *horizontal* and *vertical* directions, *respectively*, in the order from the light incident side, wherein the second optical system comprises a

plurality of elementary optical elements forming the periodic structures in the horizontal and vertical directions *respectively* and has an optical action in the horizontal and vertical directions, *respectively*, that are different from each other.

Double Patenting

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 1-5 and 7-28 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5, 13, 15-25, 27-33 and 35-38 of copending Application No. 09/836,368. Although the conflicting claims are not identical, they are not patentably distinct from each other because for the following reasons: The instant application and the co-pending application both disclose a stereoscopic image display that is comprised of an image display device for displaying synthesized images, a second optical system for directing and forming the images from the display device on light transmitting sections and light shielding second formed within an optical *modulator* or on a *mask* (having opening and shielding regions for passing or shielding the image light), and a first optical system for collecting the image light from the light transmitting sections to an observation surface, (please see Figure 1 of the instant application and Figure 1 of the co-pending application).

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This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

15. Applicant's arguments filed on **July 9, 2004** have been fully considered but they are not persuasive. The newly added claims have been fully considered and they are rejected for the reasons stated above.

16. In response to applicant's arguments concerning the double patenting rejection, the applicant is respectfully reminded that the difference between the two copending applications have been explicitly stated in the office action namely the instant application claims to use a *mask* and the co-pending application claims to use a *modulator* to perform the mask function. The are not patentably distinct from each other.

17. In response to applicant's arguments which state that the cited Ezra reference does not teach explicitly to use a mask which therefore differs from the instant application, the examiner respectfully disagrees for the reasons stated below. The diffusion plate taught in the Ezra reference functions essentially as a mask namely has regions for transmitting the image light and regions for discouraging the transmission of the image light. One skilled in the art would understand that a typical diffuser has a angular dependent transmission which means beyond certain angle there will be no light being transmitted. The cited **Mashitani** reference further is relied explicitly to provide the teachings of including a mask pattern in the diffusion plate to provide the additional function for preventing the transmission of the unwanted the light.

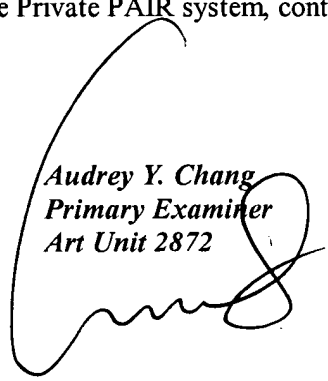
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Audrey Y. Chang
Primary Examiner
Art Unit 2872



A. Chang, Ph.D.